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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,904	08/11/2006	Wayne M. Moreau	FIS920030012US1	7740
33074 7590 07/07/2010 INTERNATIONAL BUSINESS MACHINES CORPORATION DEPT. 18G BLDG. 321-482 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533				
EXAMINER				
LEE, SIN J				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
07/07/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

EFIPLAW@US.IBM.COM

Office Action Summary

Application No.

10/597,904

Applicant(s)

MOREAU ET AL.

Examiner

Sin J. Lee

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8 and 10-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8, 10-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/22)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

1. In view of the amendment, previous 103(a) rejection over Fujimori'161 in view of Koguchi et al'244 is hereby withdrawn. Fujimori does not teach or suggest presently required triethanolamine of claim 8.
2. In view of the amendment, previous 103(a) rejection over Suzuki et al'569 in view of Koguchi et al'244 is hereby withdrawn. Suzuki does not teach or suggest present range for the mole ratio of triethanolamine to the solid base as presently claimed in claim 8.

Claim Objections

3. Claim 8 is objected to because of the following informalities: Applicants need to delete "a liquid low vapor pressure base *selected from the group consisting of*" because there is only one liquid low vapor pressure base (i.e., triethanolamine) left after the amendment.
4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 8 and 10-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 8, applicants recite the limitation that a patterned resist structure having a profile *with minimal footing* is formed. Since present specification does not define what constitutes "minimal footing", using this relative (and subjective) term renders present limitation indefinite.

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
8. Claims 8, 10, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoneda et al (US 2005/0053861 A1) in view of Koguchi et al (4,814,244).

In Example 6, Yoneda teaches (see Table 1-1, [0499], [0501] and [0468]) a resist composition containing (i) a photoacid generator, (ii) an acid-dissociable group-containing resin (B-6) (a resin in which 23 mol% of H atoms of the phenolic hydroxyl

group in poly(p-hydroxystyrene) was replaced by ethoxyethyl groups and 8 mol% by t-butyl groups), (iii) acid diffusion controllers, which are 0.1 parts by weight (which is about 0.00067 mol) of triethanolamine (*present liquid low vapor pressure base*) and 0.2 parts by weight (which is about 0.00208 mol) of 1,2-dimethylimidazole (*present room temperature solid base*) and (iv) a solvent. The mole ratio of triethanolamine to 1,2-dimethylimidazole would be about 0.322. Yoneda's composition is spin-coated on a substrate (such as a *silicon wafer or a wafer coated with aluminum coating*) to form a resist coating (see [0511] and [0387]). The resist film is exposed and PEB was conducted. The resist pattern is obtained by developing the exposed resist film. Yoneda teaches that electron beams can be used for his radiation source (see [0388]).

Yoneda does not explicitly teach present etching step after the development or present material layer comprising a chromium-containing composition. As evidenced by Koguchi (col.1, lines 11-20), a resist pattern (such as Yoneda's resist pattern) is *widely used* in the field of semiconductor device, for example, in producing a mask for manufacturing the semiconductor device. As generally stated in Koguchi, such mask is manufactured by (i) depositing a metal layer such as a chromium layer on a surface of a glass substrate, (ii) coating a resist film on the metal layer, (iii) imagewise exposing the resist film by an electron beam, (iv) developing the resist film to form the resist pattern, and (v) selectively etching the metal layer by using the resist pattern as an etching mask. Since Yoneda state that his positive photoresist composition is also used in the production process of semiconductor devices such as integrated circuit devices, and since Yoneda's composition is also usable with electron beam, it would have been

obvious to one skilled in the art to use Yoneda's photoresist composition in the method of producing a mask for manufacturing the semiconductor device as illustrated by Koguchi with a reasonable expectation of obtaining a resist pattern having high resolution, high sensitivity and outstanding storage stability. Thus, Yoneda in view of Koguchi render obvious present inventions of claims 8, 12 and 13.

With respect to present claim 10, as explained above, in his Example 6, Yoneda uses Resin (B-6) having the acid-dissociable groups of ethoxyethyl group and t-butyl group. Yoneda also teaches other acid-dissociable groups that can equally be used for his resin, such as methoxycyclohexyl group or 1-cyclohexyloxyethyl group (see [0292], [0294], [0296], and [0299]-[0300]). Thus, it would have been obvious to one skilled in the art to replace the acid-dissociable group in Yoneda's Resin (B-6) with a methoxycyclohexyl group or 1-cyclohexyloxyethyl group with a reasonable expectation of success. Thus, Yoneda in view of Koguchi renders obvious present invention of claim 10.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoneda et al (US 2005/0053861 A1) in view of Koguchi et al (4,814,244) as applied to claim 8 above, and further in view of Okumura et al (4,954,218).

Yoneda in view of Koguchi is discussed above. Even though Yoneda in view of Koguchi does not explicitly mention reactive ion etching for its etching step, it is conventionally known in the art, as evidenced by Okumura, col.1, lines 10-13, that for etching step in the art of semiconductor device, a reactive ion etching is utilized. Thus, it would have been obvious to one skilled in the art to use a conventionally known

etching technique such as reactive ion etching for the etching step in Yoneda in view of Koguchi. Thus, Yoneda in view of Koguchi and further in view of Okumura renders obvious present invention of claim 11.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sin J. Lee/
Primary Examiner, Art Unit 1795
July 1, 2010